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Wage Incentives

By R. K. WILLIAMS,
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(Before Toronto Chapter, April 1, 1931.)

If is my pleasure this evening to address you on the subject of "Wage Incentives". It is not my intention, however, to make any dogmatic assertions or to set up rules and regulations pertaining to any particular wage incentive plan. Any statements which may be made will simply be personal opinions, and are based on my records of past experiences, but they are also substantiated by such eminent authorities as Prof. Rich. H. Lansburgh, of the University of Pennsylvania, L. W. Hawkins, F.C.A., A. Cathles, O.B.E., C.A., Paul M. Atkins, M.A., sometime Instructor in Manufacturing at the University of Chicago, and Arthur G. Anderson, Prof. of Business Organization and Operation, University of Illinois, and others whose works I have studied in compiling this address.

It would not be in order for me to stand here and eulogize on the merits or demerits of any wage incentive plan. They are all of some good and each one has its own value, but, of course, it is for the Industrial Engineer to incorporate within the organization a wage incentive plan which will be adaptable to the particular business engaging his services.

What is a Wage Incentive?

Now, to introduce my subject, the first logical question to ask is, "What is a Wage Incentive?" and with your permission I shall endeavor to answer the question myself.

Some of us in past years have learned something about the laborer being worthy of his hire, and the old problem which has worried capital and labor since time immemorial has been the question of how much is "worth". The result is that in establishing wage incentives, it is management's way of endeavoring to adjust the balance between "worth" and "hire". In other words, what we wish is a method of measurement between these two essential factors.

Needless to say, a laborer should give a day's work for a day's pay. Unfortunately, however, this condition does not actually exist in practice. Theoretically it is sound, provided that all laborers were conscientious, and the management, on the other hand, was willing to pay the laborer in direct proportion to the benefits which they derive from his efforts.

Strictly speaking, therefore, a wage incentive might be anything which is paid to a workman over and above an amount sufficient to meet the bare necessities of life, but in the broader analysis, wage incentives go beyond this point and have been worked out in considerable detail in order to logically arrive at a fair method of compensating both the honest workman who is desirous of giving one hundred per cent. of his services, and the dishonest workman, who will give only a part of his time for the daily remuneration.

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The reasons for adopting a bonus system or a wage incentive are many. In former times, plants ran long hours, labor was inefficient, and if work was not accomplished to-day, it would likely be attended to on the morrow. However, with the development of our more humanitarian ideas in this day and generation, plants operate shorter hours, competition is keener, and there is a heavier demand on the part of the management for workers to give them their undivided attention during the shorter working day.

Four Moral Factors

There are four recognized methods which have been set up as possible ways of supplementing the driving habits for turning out an increase in production. These are well known to all of you, namely, Fear, Pride, Ambition and Loyalty.

Driving methods in modern factories have been pretty well eliminated and Fear only stimulates production when jobs are scarce. Pride will encourage a man to over-production for a limited time, but if more money is not forthcoming, his pride will eventually break under the strain and finally wears out completely. Ambition is a fair lever, but to deceive a man constantly with the hope that he will ultimately be raised to a higher job, soon proves its weakness if the stimulus of more money is not apparent. Loyalty, of course, in the final analysis is the strongest solution of all production problems; nevertheless should not the loyal employee be rewarded for his fidelity with something more tangible than gratitude?

Workmen of to-day cannot and will not stand driving. This might be a simple, though extremely disagreeable method of stimulating production. On the other hand, it would not retain the loyalty of an employee; it would not assure the employer of the presence of his employees every day, and the moment the task master were removed from over the workman, his production would immediately decrease.

These facts are all well known to you and are simply mentioned with a view to bringing out more clearly the recognized need which existed for introducing some method amongst workmen of inspiring them to give the management a full day's work, and to have the management in their turn pay the employee an equitable day's pay.

Therefore, it might briefly be stated that intensified competition among managers and a growing self-consciousness and independence in workmen made it imperative that some incentive to increase production be provided, which would carry out what driving was intended to do but could not accomplish. To provide this incentive was, and still is, one of the tasks of management, and although it is not to be inferred that every manager needs to install a long list of different payment plans, nevertheless adjustments of reward to work are essential to operating efficiency.

One writer has remarked that welfare work might be regarded as a method of bonus. To my way of thinking, however, to stop at this point would be extremely shallow on the part of any management in that as one human being to another, some degree of welfare work is imperative to the workers in any company, if the success of a large organization is to be assured.

There are numerous kinds of wage incentives, and these have been applied to all departments in a business, from the general manager

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down to the office boy. Senior executives frequently draw an annual bonus over and above their annual salaries; salesmen are frequently rewarded for exceeding the amounts of their quotas; and a little imagination on your parts can picture wage incentives being introduced into practically every line of business or profession.

More particularly, however, the modern understanding of the term "wage incentive" is as it is applied to factories and workers in the various departments of business institutions. It is in this sense that we shall discuss it to-night.

Reasons for Wage Incentive

With this understanding in mind, the next question arises, "Why do we apply a Wage Incentive". The answer is, that it is the management's method of encouraging their employees to utilize all their time productively.

Then again, "What does a Wage Incentive Accomplish?". Very briefly, it accomplishes greater production at reduced cost. This reduction in cost might be enlarged into innumerable classifications, such as:

- The saving of time,
- The saving of material,
- The saving of motions on the part of operators,
- The saving of overhead, etc.,

but for our purpose this evening, the simple fact that we derive an increase in production at a lower cost is the predominating factor.

Furthermore, it should be conceded to the management that in introducing an incentive, they are not entirely obsessed with ulterior motives. Frequently they have been prompted by undefiled altruism to improve the status of their employees and to mitigate as far as possible the estrangement which exists between the Big Boss and the workmen. If a man's mind is at rest so far as his wages are concerned, the results of his labors will certainly be more satisfactory to the management.

Thus a complete cycle is formed, which brings to mind the old adage of casting bread upon the waters and having it returned many times thereafter. So it happens in factory life, management improves working conditions and increases the wages of the workmen. This creates more satisfaction among the employees and the employees work to better advantage; the management secures greater production with lower costs. A larger volume of business with greater profits should result to the entire satisfaction of both the management and the employees.

Now, to bring about this highly desirable condition, Wage Incentives were finally evolved as the most tangible method.

It has been said that the "dollar" sign is the universal countersign in the industrial world. Be that as it may, if we improve a man's environment so far as his daily labors are concerned, and pay him a just day's earnings for a day's work, a long step has been taken towards developing a common brotherhood between management and labor to their mutual advantage.

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Numerous Plans Have Been Tried

To advance this idea, numerous kinds of wage incentives have been devised. The schemes which have been developed are almost as numerous as the hairs of your head. A brief history of this development should prove interesting and is not out of place.

The most common incentive has always been the old day rate, in which the management rewarded conscientious workman by an increase in pay. A later development was evolved in the piece-rate system, which rewarded a man directly for the amount of work produced. A further step was the individual premium rate, in which the worker was given extra reward for producing an exceptional day's work, and the latest development has been to enlarge on the premium system and to pay groups of workmen a collective bonus, based on the group production, to be distributed among each of the individuals.

It is, therefore, logical at this time to point out some of the weaknesses in the earlier systems of payment and to enlarge on the advantages of the bonus plan.

It seems to me, however, that the weaknesses of the various day and piece rate systems have been harped on to such an extent that many of you gentlemen must be weary of hearing them exposed. Nevertheless, when it is considered that likely more than half of the workers in both the United States and Canada are still on a day rate, either weekly, daily or hourly, it becomes more apparent that greater stress has yet to be brought on the managements of industrial concerns to make them realize, at least in many instances, what might be termed the "error of their ways". Therefore, your indulgence is requested for a moment as these are briefly discussed.

Day Rate

The day rate still has its place in a few isolated instances of modern industry, where, say, superior skill or artistry is essential to the quality of the goods produced, but it is my conviction that a thorough analysis of most businesses will eventually open up possible methods for the introduction of some form of wage incentive.

Briefly, we might list the weaknesses of the day rate plan as follows:

1. Unless the worker is of a calibre meritting an increase in wages or produces such poor workmanship as to merit discharge, there is little possibility of his rate being altered.
2. The amount or quality of his work has little bearing on the wage which he receives.
3. There is nothing to urge the worker to increased production beyond loyalty to his job, fear of his job, or constant spurring on the part of his employer, or direct superior.
4. Day rate operators require very close supervision on the part of the management.
5. Irrespective of market conditions, it is almost impossible to reduce day rates when once they have been established.
6. There is little or no inspiration to the workman unless his pride in the quality of his work is so regarded.
7. Costs depend entirely on the honesty and skill of the workman. The manufacturer cannot maintain established labor costs on his pro-

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ducts because of the fluctuation due to this constant variation. Production cost budgets become almost an impossibility under this system.

Furthermore, it is impossible to inculcate into any worker the desire of giving 100% of his energy, thought, interest and enthusiasm while working on a daily wage. These facts are governed, of course, to a degree at least, by marketing conditions and the psychology of the workers. Consequently, management has had to develop some method of wage payment which would bring the worker to a more reasonable attitude. Wage incentives were the outcome of their efforts. Therefore this explanation might also be a further answer to my previous question as to "Why do we apply a wage incentive?"

In times of stress, when laborers are many and work is scarce, there is not as much difficulty in the management maintaining a desire on the part of the workman to give a day's work when he is being paid on a daily rate, but when conditions are reversed and the work is plentiful and laborers are few, it is extremely difficult for the management to realize value for dollars given, unless a wage incentive is adopted.

The further problem also arises as to whether or not we shall pay wages at the market price or whether we shall be above or below the prevailing rate.

Then again, who or what is going to determine this fair market value? With such problems to be solved, the **weakness of day wages** as their solution is clearly apparent.

Piece Rates

Doubtlessly most of you realize equally as well the weaknesses of the piece rate system. However, as the weaknesses of the day rate system have just been discussed, it is in keeping that the exceptions to piece rates be given some brief consideration.

A good worker is often able to make more than a fair day's pay. Piece rates are easily introduced and so far as management is concerned, are simply a matter of following the line of least resistance. One of the major faults has been that when the day's pay becomes excessive, the management immediately introduces a cut in rates. The unfairness of such an action was realized long ago by the unions and ultimately piece rates were approved by union labor only if a guaranteed hourly rate were established.

Furthermore, it is not an easy matter to change workmen from a day rate to a piece rate, for the reason that the workmen will not turn out an increase in production.

I have analyzed innumerable piece rate cards and it has been my invariable experience that the amounts earned daily under the piece rate system do not vary by more than a few cents from day to day. These cards definitely prove that operators on a piece rate will not give the management maximum production for fear the rates will be cut. When once they have attained their daily objective as to the amount of work necessary to assure them of an average day's wage, they then soldier on the job for the balance of the day. The result is that in a piece-rate factory you have an inefficient condition which is costing both the management and the workers a great deal of money.

1. Piece rates encourage the waste and careless handling of materials, resulting in a natural tendency towards slovenly factory conditions.

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2. The time comes when wages are too high for the labor involved; rate cutting follows, with its resultant train of the Vipers of Industry —strikes, dissatisfaction, distrust and discontent.

3. The workman controls the output. Fear of killing the job limits his production.

4. Then we have the inverse penalty—small pay for poor work, and rate cutting for fast work—which results in a cessation of effort on the part of the employees, which adversely affects equipment, speed and costs.

The first improvement over the old piece rate was the slightly improved method in guaranteeing a day rate plus a small additional amount for each piece produced over and above the day's quota.

Towne Halsey Premium Plan

Possibly, however, the earliest method of definitely overcoming the weaknesses of the piece-rate system was the Towne Halsey Premium Plan. It is interesting to note that this plan was named after F. A. Halsey, who devised it during the time he was superintendent of the Rand Drill Co. of Sherbrooke, Quebec, Canada. The Halsey Plan (frequently referred to as the Towne Halsey Plan due to its adoption, with some slight variations, by the Yale & Towne Mfg. Co.) set up a standard time, which was based on the best time taken from records made by a fair average workman. The workman was given one-half, or possibly one-third, of the time saved.

You will readily understand that such a bonus plan was a remarkable advance over either the day rate or the piece-rate system. The firms' overhead was less, labor costs were lower and there was not the same temptation on the part of the management to cut rates.

The trouble which existed, however, on this plan was to set the standard time from past records, and there are ample instances on record of the troubles which arose in so doing, which prove rather conclusively the inadequacy of this method.

Realizing the difficulty to establish a standard time, it was recognized that past performances worked out on either the basis of day rates or piece rates were unreliable and would have to be checked very closely by time studies.

The two best known plans for overcoming this problem were the Rowan plan (which was later improved on by Emerson) and the method of "Setting Standard Times" as introduced by Fred. W. Taylor.

The differences between the Rowan plan and the system of standard times as outlined by Taylor are extremely interesting.

Rowan Plan

Rowan takes a standard time similar to the Towne Halsey method. The premium is figured so that the workman's share is a percentage of his regular rate, equivalent to the percentage of the standard time saved.

The premium is higher in the early stages than in the Towne Halsey method but decreases as the amount of the savings increase. The arguments in favor of this plan are simply that this increase offsets the desire of the workman to beat the management.

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On the other hand, it might be argued that the desire on the part of the workman for the maximum effort is reduced appreciably. That is to say, the first 20% or 30% increase is easy for any fair average operator, but the higher percentages are difficult and are paid at a lower rate by the Rowan plan.

The weaknesses of these earlier methods of wage payment in the light of our present experiences are rather apparent, but they were certainly a marked advancement towards overcoming the existing barriers between management and men, or as previously stated, between "worth" and "hire".

Emerson's Plan

Still keeping in mind the Rowan plan the next vital step towards improving these conditions was advanced by Emerson. He accomplished his purpose by setting standards partly in accord with past achievements and partly in accord with expert time studies. According to his theory, when this standard has been established, he sets it up at 100%. A good workman must maintain at least 66 2/3% to hold his job. It should be clearly understood, however, that the 66 2/3% is an arbitrary figure which may be increased or lessened, according to the work which is being accomplished. For every increase beyond this point, the workman receives a bonus, which is small at first, but is increased as he approaches the standard time of 100%.

The advantages of such a system are apparent in that they pay a guaranteed base rate plus an increase for improvement in efficiency. The bonus increases as the difficulty of further increasing efficiency becomes greater. Furthermore, the loophole for beating the management by absolute dependence on past performance is abolished by the exigencies of time studies on present production.

The disadvantage of this method on the individual worker is simply that the gradual increase in pay, with the slight increase of efficiency, results in the unambitious worker stopping at that point. There is no universal incentive to strive for the top.

Taylor's Plan

Taylor, on the other hand, brought into play some extremely original ideas and it was from these that the Gant system was finally evolved.

Taylor's system was different to anything which had been previously worked out in that he set up standard times for all jobs, which were estimated on close scientific precision, including the perfection of materials, equipment, processing and methods. He undertook to train the workmen carefully and patiently in the best and the shortest way to do their work. When these details had been established, he then set up a standard time, which was based on the theory of what the trained man was able to accomplish under ideal circumstances.

Taylor's system guaranteed regular wages until the workman's skill had been acquired. He provided the workmen with skilled instructors so that they could take advantage of every possible assistance. When the operator became skilled, he was paid from 30% to 100% bonus, in addition to his regular wages.

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Taylor's strong argument seems to have been that irrespective of the workman maintaining standard, he never received less than his present wages. That is, a workman going below par was assured of his regular rate. The Taylor system, however, is hardly adaptable to a factory passing through the transition stage from day rates to the bonus system. It was developed primarily for use after conditions had been standardized, jobs studied and tasks set.

But Taylor carried his ideas beyond this point in establishing his "Differential Piece Rates". All the conditions were similar with regards to standard time, conditions and instructions, but when the work was eventually accomplished in standard time, he paid the operator at a higher piece rate than ever before.

On the other hand, if the operators fall below standard, the piece rate is less. In other words, on the differential piece rate system, the higher output yields more pieces at a higher rate. The lower output yields less pieces at a lower rate. It is readily apparent that such a method is a tremendous incentive to high quality workmanship and it also penalizes failure on the part of the workman to deliver the goods.

There are many points in favor of these systems in that they protect both the management and the employees, but it might also be said that either Gant's or Taylor's system is comparatively difficult to introduce, expensive to maintain and involves intelligence, ability, and diligence on the part of the management to a degree which is comparatively rare.

The results which may be realized from their systems are unbelievable but they require a heavy investment of time, money and patience.

The points in favor of bonus plans are numerous but possibly the most important could be itemized as follows:

(a) The increased output means lower prices, which should result in a greatly increased demand.

(b) Increased demand should increase the employment, thus fulfilling to a greater degree the economic right of every man to hold a job.

(It is not my intention at this point to enter into an argument on the economic conditions with which we are faced at the present time. My subject deals clearly and definitely with Wage Incentives.) It would appear, however, that the cycle of economics will prevail and that in time conditions will readjust themselves and the demand for increased production and lower costs will again be established in lines of industry which have not been over-produced.

The bonus plan results in larger dividends, in which even the workman should be allowed to share, and lowers the cost of the products, which he helps to consume.

After having advanced all these arguments in favor of Wage Incentives, it is interesting at this point to read a remark made by Frederick W. Taylor, as follows:

"With accurate time knowledge as a basis, surprisingly large results can be obtained under any scheme of payment from day work up."

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There is no question but that ordinary day work, resting upon this foundation—viz., time studies—would give greater satisfaction than any of the efficient payment systems in common use, but without the incentive back of the workman, it is next to impossible to realize such an ideal condition.

There are numerous other systems which we could discuss, but fundamentally they vary only sufficiently as to allow them to be designated with the names of their authors. In the final analysis there are only a few fundamental principles involved, whether we are working on the Task and Bonus system as established by Taylor's associate, H. L. Gant, or the Norm System, or the Bedeaux Point System, or numerous others one might care to mention.

Gant's Task and Bonus

Gant's Task and Bonus system, however, has one or two major advantages over the other systems which are worthy of note.

The task is set so that every worker will equal or do better than the task assigned. It is built on the theory that a worker will make his bonus every time.

Therefore, if the task is accomplished, the company will receive a definitely known minimum output at a lower total cost per piece than under the older wage payment systems. In return for the workman exerting himself, he is guaranteed his hourly rate if he fails to make the task, and he is also assured of ample reward for exceeding the task. He is paid his regular hourly rate for the time allowed for the task, plus a percentage of that time, which is equivalent to high piece rates. Thus the workman has the advantages of the day rate when he fails to make his task and also the advantages of the high piece rate when he is successful.

For the Task and Bonus system to be carried through successfully, however, management must have full control of operations to insure proper conditions for the maintaining of a maximum output at all times. Standards must be set and Purchase Control, Storekeeping and Factory Planning must be fully established.

The major advantages of this Task and Bonus system are its beneficial effects on cost predetermination, and hence quotations of selling price; on the scheduling of the work through the shop and, therefore, production control.

The day rate holds until the task is achieved, when there is a sharp jump in the wage due to the payment of the bonus. The worker is encouraged to reach the task every time.

It is thus possible to predetermine overhead costs and to use these in developing standard costs.

The pull towards task time makes it possible to schedule plant operations more accurately, with an almost certain knowledge that the machines will be available at definite times.

Bedeaux System

Then the Bedeaux system, for instance, has an advantage in that all work is broken down to common denominators, and hence a comparison between departments is somewhat simplified.

So we could continue indefinitely, but as my time is limited we shall press on to the next step of major importance.

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Now, although these individual premium plans are a great improvement over the day or straight piece rate systems, there is still the element of the individual worker which, for many reasons, is an undesirable factor. This naturally leads us into a discussion of the Group Bonus Methods of Payment.

Group Bonus Methods

If you and I are engaged together to shovel sand into a wagon and we are paid on a straight day rate, it is more than likely that you will see to it that I shovel more sand in the day than you do. On the other hand, if we are to receive, at the end of the day, a dollar bonus between us for every load over and above a definite number, I am going to see to it that you shovel just as much sand as I will shovel, because if the bonus is to be split equally between us, it is in my interests to see to it that you earn your share.

Therefore, the psychological reaction of group incentives on the minds of the workers is identically the same.

Under the group bonus plan it is going to be in the interests of each operator in the group to see to it that each one performs his duties in such a way that the entire group will share equally or pro rata in the bonus.

From this explanation it follows that a group bonus may be introduced anywhere where the co-ordinated efforts of workmen are required.

A brief outline of the group bonus and the steady development towards the perfection of sound working systems might now be in order, but, as previously stated, since I am not recommending the adoption of any particular bonus system, the general advantages are all that need be mentioned. On the other hand, I do recommend the adoption of the group bonus in every industrial institution that lends itself to such methods.

It should be clearly borne in mind that the group bonus is an advanced step in the Individual Wage Incentive plans. Any type of payment may be applied to the development of a group bonus, or group incentive.

Besides developing the spirit of team-play among the operators, the fact that only one premium or bonus has to be figured for each group involved, reduces the amount of clerical labor required in making the computations.

Furthermore, foremen and supervisors may be included, as well as truckers, sweepers, janitors, etc., thus eliminating, to a large degree, the problem of the indirect labor.

It is simple for the management to check the efficiency of the groups by comparing a few time tickets. It brings all workers together on a common ground to assist the substandard worker in reaching increased efficiency.

The group is only credited with the amount of finished stock passing from the department. The total standard time multiplied by the number of pieces constitutes the standard hours credited to the group. Thus, by referring to a group bonus table, anyone can easily figure his earnings.

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The time department usually issues a slip to each group daily so that they know their earnings from day to day.

Special advantages of the group system could be cited as follows:

The "Goods in Process" inventory is greatly reduced because several operators may be working on the same lot at the same time.

The floor around machinery is not clogged up with partly finished materials, waiting to be checked or moved.

The workers of a group force their materials over the line to the next group, as they are only paid on the finished product. This automatic flow cuts out the stock chaser, cuts down on trucking in and about machinery, allows more floor space by the closer spacing of machinery, and thereby makes a department operate without confusion or congestion.

More accurate promises of delivery are possible because materials in process do not get lost or thrown to one side.

The bottle neck operations are overcome by assigning the fastest men in the groups to this point, and similarly the slow operations are rushed through to completion by the close attention of the whole group towards keeping the lines balanced.

Group Bonus tends to develop all-round men and any disadvantages which might be cited, such as backbiting in the groups due to a poor operator holding back the group earnings, in actual experience, are more than offset by the beneficial results obtained. The disturbing element is usually turfed out of the group by the workers themselves, or he gradually learns to "play the game" with them and eventually becomes a booster of the system.

The general benefits of group methods could be listed as follows:

Group Bonus pays a fair day's wage for a day's work.

Group Bonus reduces labor costs.

Group Bonus maintains high standards of quality.

Group Bonus fosters co-operation, spirit and effort on the part of employees.

Group Bonus trains new employees more quickly and more thoroughly.

Group Bonus develops better supervisors.

Group Bonus reduces overhead and the cost of supervision.

Group Bonus retains the incentive of the piece-work plan.

Groups are only credited with accepted work, which simplifies costing.

It reduces faulty workmanship as re-operations are done on the operator's own time.

General Rules

In closing, there are a few general rules which should be applied before adopting any wage incentive plan, or system of group bonus.

Working conditions should be standardized.

Methods should be studied with a view to adopting the best way to perform the work.

A minimum wage should be established to reassure the timid worker who fears an actual reduction in wages.

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Precautions should be taken to make sure that standards are set accurately and fairly. These should never be changed unless corresponding changes have been made in operating methods or equipment.

The worker should be paid honestly for the work produced.

All the workers should clearly understand the bonus system on which they are to be placed.

The greed of gain should not predominate the management; they should be satisfied with a fair share of the earnings. No wage incentive will be successful if the employees are distrustful of the management.

It should be explained to the workers that reduced costs will increase their earnings. Thus mutual benefits are therefore realized.

Wage incentives should conform to costs.

Wage incentives should be very simple; employees should be able to figure them with ease.

Personally, gentlemen, I think a good industrial engineer should be prepared to carry out the preceding rules in any wage incentive which he might install.

An industrial engineer should not pretend to have a blanket policy to cover all the various industries, but he ought to pride himself on having the intelligence and practical experience to adopt a Wage Incentive plan to meet the peculiarities and the diversified ramifications of the business which he is analyzing.

Industrial engineering is not confined to time study work. Time studies should simply be incorporated within the programme of engineering service.

If an engineer has had the experience, all he then requires is the privilege to demonstrate how he can save the management money in their business.

Unfortunately in Canada this is too often denied to him due to the scepticism, fear and doubt which still permeates the minds of most of our Canadian executives.

The time has come when our Canadian managers should be engineering conscious and should realize the benefits to be derived from the experience of men who have made a general study of industrial problems. We should not wish to pose as "efficiency experts", but rather as "human beings" with a fund of practical knowledge of operating principles acquired from our associations in a wide field of industry. Let us impress the importance of this fact on every intelligent executive who is constantly struggling to increase his profits.

Personally, I believe this can only be fostered and finally brought about by the whole-hearted support of younger executives in organizations such as we have here to-night, who realize as never before that the industrial engineer has a place in industry to the same degree that the medical specialist has in our private life.

For this reason the Association of Cost Accountants & Industrial Engineers should have our undivided support and unqualified approval, and I sincerely trust that the time will soon come when its influence may be more keenly felt and appreciated throughout our Canadian industries.

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Plant Records for Accident Experience

By THOMAS NORMAN DEAN, M.A., F.S.S.,
Statistician, Workmen's Compensation Board of Ontario.

(From "Abitibi")

THE relation of costs imposed by The Workmen's Compensation Act of Ontario to production costs in the pulp and paper industry of the Province constitutes an interesting statistical speculation. The following data have been obtained from "Report on the Pulp and Paper Industry in Canada, 1928," published by the Forest Products Branch, Dominion Bureau of Statistics, Department of Trade and Commerce, Canada:

Item	Quantity	Value
Wood Used	1,400,968 cords	\$17,990,338
Wood Exported	633,710 cords	6,090,173
Wood-pulp Produced	1,050,335 tons	35,708,079
Wood-pulp Exported	232,450 tons	11,106,883
Paper Produced	880,645 tons	59,474,123
Fuel and Electricity Used .....	.....	8,167,978
Chemicals Used .....	.....	3,090,125
Capital Invested .....	.....	220,281,502

Compensation Costs

Without delineation of bases and assumptions, or of intricate statistical calculations, the following is offered as a reasonable estimate of the compensation cost of the total and unit production until time and circumstance shall produce more exact determination:

Item	Cost of Compensation	Each ton of Paper
Production of Wood	\$224,751.44 (Total)	\$.2552
Production of Pulp	141,175.12	.1603
Production of Paper	100,211.77	.1138
Chemicals Used	16,223.20	.0185
Fuel and Electricity Used	128,546.00	.01459
Plant and Equipment	178,978.61	.2032

	\$789,886.14	
For Wood and Pulp Exported	124,557.06	

Total	\$914,443.20	

Cost per cord of wood \$.1578
Cost per ton of pulp1322

Compensation Not the Largest Cost Factor

To these costs must be added the expense of first aid service, contributions to safety associations and benefit organizations, bulletin

PLANT RECORDS FOR ACCIDENT EXPERIENCE

services, instruction in safety and first aid, the expenditure of time in supervising safety activities, compensation service and accounting and attending meetings and conventions besides the cost of installing guards and carrying out safety programmes.

It is not generally recognized that the major items of cost are in these things which are more or less taken for granted: the principal cost is probably in time spent. The determination of exact costs over the whole industry is well-nigh impossible; it is no sinecure to achieve even a reasonable estimate. For present purposes, these costs are set at \$475,000 with the resultant cost of \$.4876 for each ton of paper produced.

The total annual cost of compensation to the pulp and paper industry of Ontario, therefore, is estimated to be \$1,490,000, and at \$1.40 a ton of paper produced. This means that capital invested must pay for compensation an annual rent of two-thirds of one per cent. and each ton of paper must carry an operating expense of 2%.

A Six-fold Interest

Whether or not these estimates, and they are offered merely as such, are reasonably accurate or not is beside the present question. The immediate interest is six-fold:

First—Because of industrial accidents and the consequent cost, the pulp and paper industry must pay a heavy rent on capital investment and carry a burdensome operating charge which enters directly into price of product.

Second—Because the estimates are for the industry within the Province, there must necessarily be differences when plant is compared with plant.

Third—Because these costs are partly controllable, the reduction of accident costs is a function of operative management and is of considerable importance.

Fourth—Because a portion of costs are non-controllable by operating management the pulp and paper industry must of necessity be interested in the problem of accident cost reduction generally, which bespeaks co-operation with agencies of other industries.

Fifth—Because prosperity of an industry is in large extent, dependent upon interprovincial and international competition, workmen as well as management have interest in accident cost reduction.

Sixth—Because the frequency and severity of industrial accidents are measured by cost, reduction in costs means mitigation of pain and suffering as well as loss of wages and well-being to the workmen.

Differential Measurement

In order to provide a reasonable index of the cost of accidents in the Province of Ontario in the Pulp and Paper Industry, a recently developed method of measurement has been employed. This consists of three distinct steps. The assessments chargeable to the industry for each year, as well as the losses pertaining to each year have been determined. The assessments and losses are proportioned to the assessable payroll. The rate of losses is divided by the rate of assess-

COST AND MANAGEMENT

ment giving a differential which has evaluated the hazard for the particular year, for it is the steadfast principle of the Workmen's Compensation Board to make each year as well as each industry as far as possible bear its own losses. Resultant differentials measure accident experience and evaluate the result of activities looking towards the reduction of accident cost.

The results in the Pulp and Paper Industry in Ontario (Class 2 of The Workmen's Compensation Act) for the years 1920-1928 have been as follows:

Year	Differentials			Total
	Losses	Cost of Safety Ass'n's	Cost of Workmen's Compensation Board	
1920 .....	.91	.01	.01	.93
1921 .....	.98	.02	.02	1.02
1922 .....	.99	.02	.02	1.03
1923	1.20	.02	.05	1.27
1924 .....	.73	.02	.06	.81
1925 .....	.93	.02	.05	1.00
1926 .....	.94	.02	.04	1.00
1927 .....	.94	.03	.05	1.02
1928 .....	.80	.03	.05	.88
All Years .....	.93	.02	.04	.99

The differentials relate to each dollar of assessment paid, that is, for every dollar of assessment collected from 1920 to 1928 inclusive, 99 cents has been paid out.

The method of differentials can be extended to analysis of losses and to separate plants. Evaluation can be made to a comparable basis so that the particular item or items causing accident experience in every plant can be clearly discerned. Corrective measures can then be applied to the plant and item causing excessive costs. As correction proceeds general principles will be attained.

This method known as "Index Factors of Cost Hazard Differentials" has been applied to accident experience in Class 1 of the Workmen's Compensation Act by the Lumbermen's Safety Association with an increasing degree of success. A Compensation deficit of over \$326,000 in 1927 will, in all probability, be wiped out in 1929, if a surplus and consequent rate reduction be not attained. Similarly one plant in the lumbering industry, acting as experimental laboratory for the differential method, has steadily reduced cost ratio from \$1.73 in 1927 to less than 40c. for 1929. A mining firm employing the same method has in the same period, more than halved its ratio. In neither of these firms had the record shown a steady tendency of either increase or decrease for any two years in succession, prior to the adoption of this method.

PLANT RECORDS FOR ACCIDENT EXPERIENCE

Simplicity Needed for Plant Record

Plant records for analysis must be uniform, simple and comprehensive. Too much importance perhaps has been given to the feature of comprehensiveness to the minimizing of uniformity and simplicity. This has led to results and deductions which, statistically speaking, are oftentimes misleading. Attention has probably had focus more in the system of recording than in results. Statistics, contrary to general conception, are facts. It is in the compilation and interpretation of fact that dispute has arisen. Many presentations dubbed statistical are no more statistics than the dolls of a baby are children, although the same elements of self-deception are present.

One of the common difficulties in plant records is the tendency to record losses in the period in which the loss is paid rather than in the period in which the loss is incurred. It is impossible to correlate two things which are not coterminous. As compensation rates are determined for each year it is necessary that all costs arising out of that year be related thereto. Accounting necessity may demand accounting on the basis of the current year but for analytical purposes, basis must be the calendar period. It is not difficult to reconcile the two things. Losses, as well as assessments are to be consolidated for accounting and segregated for analysis. Time after time complaint is made that assessments paid in one year greatly exceed the losses but when proper allocation to a coterminous period is made it becomes evident that assessments charged do not exceed losses.

Reducing Accidents Plant Aim

The purpose of reducing accident costs should always be kept in mind in plant records because a reduction in accident costs means a reduction in costs of production. Every case of accident should be followed closely and frequent contact had. The plant record should be a record of these contacts, and what had been done. If, for example, cases are being over-hospitalized, a record of the fact in bulk will not reduce costs. The plant record is the stimulus for action as well as the record of action.

It is not within the limits of present space or purpose to point out the many ways in which accident costs can be reduced nor how the reductions can be made. Article after article has been written about these points and many more are forthcoming. It is present purpose to set out the general nature of plant records of accident experience so that the analytical method can be exemplified and the reduction of accident costs may be attained.

The first thing is a knowledge of past experience so that a standard be set up. Is the past record good or bad? If bad, wherein were correctable losses? It is extremely doubtful if many plants have information in such form to set up a standard. To remedy this, application should be made to the Ontario Pulp and Paper Makers Safety Association or to the Workmen's Compensation Board, either of which bodies will gladly forward a Cost Ratio Card with specific information as to experience. After standard is set up the payroll and assessments for the year should be obtained. The plant may record this for departments, the totals of payroll being what has been submitted by the firm to the Workmen's Compensation Board and the assessments being what the Board has charged upon the payroll.

How and Where to Cut Waste

(A survey prepared and published by The Elliott Service Company, New York. Reprinted by permission.)

HOW AND WHERE TIME IS WASTED

1. Laying off without advance notice.
2. Unnecessary talking and visiting.
3. Failure to maintain steady pace on the job.
4. Failure to ask questions when orders are not clear.
5. Being late for work.
6. Late in starting work.
7. Slowing down towards end of shift; quitting early.
8. Trying to work when not physically fit.
9. Failure to follow instructions.
10. Not keeping tools handy and in order.
11. Forgetting where tools were left.
12. Using wrong or defective tools.
13. Doing personal work without permission.
14. Not reporting promptly when work is done if other work is to be assigned.
15. Taking more time than needed when filling out reports and records.
16. Mistakes necessitating doing work over.
17. Taking time to do a better or finer job than necessary.
18. Not giving all possible co-operation to fellow workers, foremen, inspectors, new help.
19. Failure to ask for help when needed.
20. Improper care or operation of machines resulting in lower output or breakdown.
21. Not reporting promptly when repairs are needed.
22. Failure to keep aisles clear.
23. Waste motions due to unsystematic personal working habits.
24. Lack of suitable clothing when exposed to heat, cold or weather, causing frequent interruptions for relief.
25. Waiting around, when not necessary, for tools to be repaired.

HOW AND WHERE MATERIALS AND SUPPLIES ARE WASTED

1. Defective workmanship causing breakage or spoilage due to:
 - (a) Wrong, inadequate or defective tools or machines.
 - (b) Worker not physically fit; may have defective vision.
 - (c) Carelessness, indifference, or inattention to work.
 - (d) Failure to understand orders or lack of knowledge of work.
 - (e) Too much in a hurry to get through.

HOW AND WHERE TO CUT WASTE

- (f) Using sub-standard or defective material not suited to the job.
- (g) Failure to follow standard set for the job.
- 2. Failure of the worker to understand the money value of supplies and materials.
- 3. Careless handling of material in process.
- 4. Improper use of supplies such as light bulbs, oil, oil cans, report forms, time cards, stationery, grease-guns, paper towels, nails, screws, waste and wiping rags.
- 5. Wrong piling or storage.
- 6. Failure to protect from the weather, heat, moisture, acids, or dust.
- 7. Overloading trucks causing damage to materials transported.
- 8. Requisitioning more material or supplies than needed and failing to return unused balance.
- 9. Scrapping materials or supplies that can be salvaged.
- 10. Improper handling of finished product in storing, crating, loading and shipping.

HOW AND WHERE MACHINERY AND EQUIPMENT ARE WASTED

- 1. Improper operation of machines, machine tools, and small tools.
- 2. Rough use or abuse of machinery and tools.
- 3. Lack of lubrication.
- 4. Overloading.
- 5. Wrong speeds.
- 6. Failure to keep clean.
- 7. Loss or theft of small tools.
- 8. Failure to return tools and portable equipment to their proper places.
- 9. Carelessly using machines or tools for purposes for which they were not designed.
- 10. Inadequate or make-shift repairs.
- 11. Using wrong material or supplies.
- 12. Misuse of equipment such as extension lights, ropes, ladders, trucks, elevators, hose, and specially furnished clothing or protective devices such as safety belts, welders' helmets, goggles.
- 13. Failing to report promptly all defects or conditions needing correction such as excessive wear of parts, vibration, dust, faulty bearings, minor damage.
- 14. Neglecting machines which are not in use.
- 15. Not understanding duties with respect to the care and use of machines and equipment.

HOW AND WHERE ELECTRIC CURRENT, STEAM, COMPRESSED AIR, WATER, HEAT AND GAS ARE WASTED

- 1. Failing to shut off when not in use.
- 2. Leaving machines running idle.

COST AND MANAGEMENT

3. Using more than needed; such as larger portable tools, or larger lights than necessary; too strong gas flame or improper mixture.
4. Using compressed air for purposes for which it is not intended.
5. Failing to report leaking valves or fittings, arcing switches, escaping gas, and other conditions needing correction, such as faulty bearings and improper belt tension.
6. Failure to report overheated motors.

HOW AND WHERE SPACE IS WASTED

1. Poor housekeeping.
2. Improper piling of materials and supplies.
3. Collecting scrap piles in improper places.
4. Storing materials that should be scrapped.
5. Keeping unnecessary materials and supplies at work place.
6. Spreading materials and supplies that could be piled.
7. Scattered or placing of tools, materials, supplies and portable equipment around work or in aisles or passageways where clear space is needed.
8. Failure to follow established system of routing.

THE WASTE AND COST OF ACCIDENTS

DIRECT COSTS

1. Compensation to the injured.
2. Medical and surgical attention.
3. Hospital fees and expense.
4. Supervisory and clerical services to operate workmen's compensation act.
5. Assessments.

NOTE: Accidents can not be eliminated entirely, but they can be cut down to what might be called the "irreducible minimum". The cost of compensation for this minimum may be regarded as a legitimate overhead charge. But all costs in excess of this minimum requirement are actual losses which can be prevented by preventing needless accidents.

INCIDENTAL COSTS

These costs are conservatively estimated to be not less than FOUR times the amounts paid in compensation, medical and hospital expenses. Moreover, these items are NOT INSURABLE.

1. Time lost from production by employee as a result of injury.
2. Time lost from production by other employees who stop work.
 - (a) Out of curiosity.
 - (b) Out of sympathy.
 - (c) To assist injured.
 - (d) Because of nervous shock.

HOW AND WHERE TO CUT WASTE

3. Temporary slowing down of production in department because:
 - (a) Employees gather in groups to talk about accident.
 - (b) Thoughts of the accident continue to divert their attention from their work (this may also lead to another accident, spoiled material or damage to equipment).
4. Time lost from production by foremen, supervisors or other executives to:
 - (a) Aid injured employee.
 - (b) investigate cause of accident.
 - (c) Arrange for injured employee's production to be continued by some other employee.
 - (d) Select, train, or break in new employee to replace injured.
 - (e) Prepare accident reports for employer and Workmen's Compensation Board.
5. Time of first-aid attendant and hospital department staff.
6. Spoilage and waste of material caused by accidents.
7. Damage to machines, tools, building or other property.
8. Losses due to interference of accidents with production, such as failure to fill orders in time, loss of bonuses, payment of forfeits, cancellation of orders, loss of customer goodwill, etc.
9. Loss of profit on productivity of employees affected by the accident and on machines temporarily idle.
10. Loss in putting injured employee back on pay-roll and paying full wages when injured is not fully recovered and is unable to earn the wages paid.
11. Loss through inferior productive effort due to inability (where high assessment rates prevail) to attract and hold high grade workers. Inferior workers waste more and cause more accidents.

LOSSES FROM NO-INJURY ACCIDENTS

To one accident causing injury and loss of productive time of employee, there are, in industry, 29 accidents that result in slight injuries without loss of time (except for first aid) and,

300 no-injury accidents.

These 300 no-injury accidents also cause:

1. Loss of time of workers, foremen, superintendents, plant engineers and others in making repairs, getting things going again, doing a job over, etc.
2. Damage to machinery and equipment.
3. Waste of materials and supplies.
4. Interference with production schedules, delays, waiting for new machine part after breakdown, etc., and increased hazards from rushing the work afterward.

Smith was called to the 'phone, "Are you going down our road this morning in your car?" inquired a feminine voice. "No," answered the astonished Smith. "But why do you ask?" "Oh, that's all right!" came in relieved tones over the wire. "I only wanted to know if it was safe to send my little girl around the corner on an errand."

COST AND MANAGEMENT

Waste Which Foremen Can Prevent

(A survey prepared and published by The Elliott Service Company, New York. Reprinted by permission.)

TO-DAY, industry is more concerned with cutting waste than any other single consideration. Much of this work must be done by foremen. To help them, this list of the main causes of waste which foremen are likely to encounter has been compiled by The National Foremanship Board.

THE WASTE OF TIME

1. Lack of proper planning; keeping workers waiting between jobs or waiting for material.
2. Failure on the foreman's part to thoroughly understand orders and instructions received.
3. Lack of knowledge of what constitutes a full day's work.
4. Failure to make orders and instructions clear to workers.
5. Failure to insist that tools, supplies, and portable equipment be kept in proper places.
6. Ordering overtime work that could have been avoided.
7. Not seeing that men are supplied with proper tools and equipment for every job.
8. Allowing workers to intentionally do less work than they can.
9. Failure to notify employment department when more men are needed.
10. Keeping too many men at work.
11. Failure to write records and requisitions intelligibly.
12. Failure to question and correct workers who lay off.
13. Allowing workers to get habit of talking, visiting, killing time.
14. Failure to get workers started on time; slack supervision.
15. Delay in making decisions.
16. Unnecessary absenteeism or tardiness on the foreman's part.
17. Being late with reports.
18. Not investigating immediately when repairs are needed.
19. Unnecessary visiting and conversation on the job.
20. Failure on the foreman's part to organize his own time and work.

THE WASTE OF IDEAS

1. Failure to listen and comment when workers offer suggestions.
2. Failure to encourage workers to offer suggestions.
3. Not asking worker's advice on problems.
4. Failure to read and study about the work and about business methods generally.
5. Failure to get from new men helpful ideas which they may bring from previous employment.

WASTE WHICH FOREMEN CAN PREVENT

6. Not consulting enough with other departments, as engineering, etc.
7. Failure to consider or refer to the proper person all usable suggestions no matter where they come from.
8. Failure to take proper interest in foremen's meetings.

THE WASTE OF MATERIALS AND SUPPLIES

1. Inadequate supervision resulting in spoilage of material.
 - (a) New men not thoroughly instructed.
 - (b) Men not instructed on new work.
 - (c) Blueprints or sketches torn or illegible.
 - (d) Machines out of order or not adjusted.
 - (e) Failure to follow each job through.
2. Failure to explain money value of materials and supplies to workers.
3. Failure to give orders and instructions clearly.
4. Permitting improper or rough handling of materials and supplies.
5. Not paying attention to workers' eyesight and health as possible causes of spoiled work.
6. Lack of discipline among workers, thereby encouraging carelessness and off-quality work.
7. Allowing men to use supplies unsuited for the work; too good or not good enough.
8. Inability to trace defective work to the man who did it so that it can be corrected.
9. Taking men's ability for granted; not making sure that workers are qualified for the work they are to do; especially new men.
10. Not knowing right kind of supplies to order.
11. Ordering more materials and supplies than necessary and not returning excess to stock.
12. Failure to see that materials are piled and stored properly.
13. Failure to investigate all bare wires, leaky valves, pipes, fittings on steam, water, gas, electric and compressed air lines, etc.
14. Allowing workers to use oil, compressed air, small tools, chemicals, etc., for personal use.
15. Letting defective material go through as standard.
16. Lack of system in controlling outgo of supplies to prevent loss and theft.
17. Scrapping materials that could be salvaged.
18. Permitting the waste or abuse of such supplies as brooms, waste, stationery, oilers, light globes, shovels, rubber hose, etc.

THE WASTE OF MACHINERY AND EQUIPMENT

1. Failure to plan work so that full and proper use may be made of all available machinery.
2. Failure to inspect machinery, to keep it in good condition and to prevent breakdowns.
3. Foreman's lack of knowledge of possible use and capacity of various machines.

COST AND MANAGEMENT

4. Failure to make regular examinations of wire ropes, belts, chain drives, gear drives, conveyors, lubrication system, valves, etc.
5. Using unnecessarily large and powerful machines for small work.
6. Lack of co-operation with maintenance department; upkeep, repairs, painting, etc.
7. Not protecting idle machinery from weather, dust, dirt, rust, fumes, etc.
8. Allowing machinery to stay dirty; lack of periodical cleaning.
9. Failure to inspect for proper lubrication of all moving parts.
10. Failure to make needed repairs promptly.
11. Lack of instruction to men on the proper operation of machinery.
12. Lack of proper discipline to prevent abuse of machinery or equipment.
13. Allowing men to make "shoe-string" repairs.
14. Failure by the foreman to keep informed on latest types of machinery and equipment.
15. Failure to pay attention to worker's opinions on value and condition of machinery.
16. Abusing small machines on large work.
17. Repairing machinery that should be scrapped; may cost more than new machinery.
18. Scrapping machinery that should be repaired.

THE WASTE OF MAN POWER

1. Failure to control turnover of capable workers because of the following:
 - (a) Not appreciating the direct and indirect costs of labor turnover.
 - (b) Too much "bossing" and not enough intelligent direction.
 - (c) Too strict or too lax enforcement of discipline.
 - (d) Not keeping promises which could be fulfilled.
 - (e) Making promises which can't be fulfilled in regard to wages, promotion, etc.
 - (f) Discharging men without sufficient cause; improper use of the discharge slip as a penalty.
 - (g) Keeping a worker on a job for which he has a violent dislike.
 - (h) Treating one man better or worse than others; favoritism.
 - (i) Taking sides in worker's arguments.
 - (j) Criticizing one worker to another.
 - (k) Failure to question men who leave of their own accord.
 - (l) Failure to interpret correctly management's real aims and policies to workers.
 - (m) Failure of the foreman to do all he can to fairly adjust wages and working conditions.
2. Failure to get full production as quickly as possible from new workers.
 - (a) Not receiving new workers in kindly, helpful manner.
 - (b) Incomplete job instruction of new workers.

WASTE WHICH FOREMEN CAN PREVENT

- (c) Failure to impress on new worker the necessity of a full day's work, and what it consists of.
- (d) Failure to select new men with proper qualifications for work to be done.
- (e) Impatience with new men who learn slowly.
- (f) Failure to get other workers to show a friendly, helpful attitude to new men.
- (g) Not informing new worker as to plant living conditions and regulations, as safety, paydays, lavatories, drinking water, lockers, washrooms, etc.
- (h) Failure to contact new worker as often as may be required.
- (i) Lack of information to new worker about unpleasant or dangerous parts of his work.

3. Failure to get the best efforts of which workers are capable.

- (a) Failure to commend men for doing good work.
- (b) Failure to explain as much about the work as possible in order to make it interesting.
- (c) Lack of interest in worker's progress and personal affairs.
- (d) Failure on the foreman's part to admit a mistake to worker.
- (e) Lack of attention to worker's ability and temperament in assigning work to him.
- (f) Failure to study men as individuals in order to get their best efforts.
- (g) Countenancing the formation of cliques or groups among workers.
- (h) Rating men on any grounds but competence; racial, religious, fraternal, etc.
- (i) Keeping a man in a job for which he is physically or mentally unsuited.
- (j) Permitting a man to remain at work when he is sick.
- (k) Not giving men all the help they need.
- (l) Failure to promote workers when it is possible and advisable.
- (m) Lack of due consideration of problems affecting wages and working conditions.
- (n) Failure to train an understudy.

THE WASTE OF ACCIDENTS

1. Failure to recognize accident prevention as part of production.
2. Failure to give all men thorough instruction in safe practices.
3. Failure to install mechanical safe-guards and to keep them in repair.
4. Allowing men to work with guards out of place.
5. Failure to display danger signs at proper places and to see that they are clean and legible.
6. Failure to thoroughly understand indirect accident costs.
7. Poor housekeeping.
8. Lack of understanding of what constitutes an accident hazard.
9. Failure to keep records of accidents, to analyze them, and to use the information gained.
10. Not setting a good example in the matter of safe practices.

COST AND MANAGEMENT

11. Lack of regular and conscientious safety inspection.
12. Failure to enforce consistently all safety rules and regulations.
13. Allowing men to work without necessary protective devices such as goggles, welding helmets, safety shoes, safety belts, etc.
14. Failure by the foreman to recognize his responsibility for accidents in his department.
15. Failure to stimulate and maintain interest of employees in accident prevention.
16. Lack of co-operation with state and insurance inspectors.

THE WASTE OF NON-CO-OPERATION

1. Failure to co-operate
 - (a) with other foremen and departments,
 - (b) with clerical, engineering, sales, employment departments, etc.
2. Lack of thorough understanding of company policies and failure to explain them to workers.
3. Failure to deal sensibly with gossip and tale-bearing.
4. Passing the buck; to other foremen, to workers or to management.
5. Not adequately representing the workers to the management.
6. Permitting disgruntled employees to agitate against the company.
7. Failure by foremen to give full support to unpopular company regulations.
8. Failure to promote friendliness and co-operation among workers.
9. Thoughtless criticism by the foreman himself of any company policy or of any individual in the organization.
10. Not co-operating whole-heartedly with management in its educational activities such as apprentice training, bulletin boards, employee's magazines, suggestion systems, safety meetings, etc.

THE WASTE OF SPACE

1. Improper piling or storage of materials.
2. Not enough attention paid to routing of materials through plant.
3. Wrong placement of machines and other permanent equipment.
4. Allowing men to leave portable tools, ladders, wheel barrows, etc., in way of other workers; failure to keep passageways clear.
5. Keeping material which should be scrapped.
6. Lockers, oil tanks, stock supplies, etc., in inconvenient places.
7. Letting unused machinery and equipment take up valuable space.
8. Leaving needed space unused for want of needed repairs to roof, floor, etc.
9. Allowing "dark spots" in plant; inefficient lighting.
10. Failure to maintain order and good housekeeping in department.
11. Keeping unnecessary materials at work-places.

"Is the pleasure of the next dance to be mine?" asked a persistent beau of a girl who was keen to avoid him.

"Yes, entirely," she replied.

DEATH OF VICE-PRESIDENT G. C. LEROUX

DEATH OF VICE-PRESIDENT G. C. LEROUX

George C. Leroux, of Montreal, vice-president of this Society, and chairman of Montreal Chapter in the year 1928-29, died at Hotel Dieu Hospital, Montreal, on September 9th, after a short illness. He was in his 56th year. The late Mr. Leroux held the position of assistant inspector of income tax for the Dominion Government at Montreal. He was a member of the boards of the Corporation of Public Accountants of the Province of Quebec, and of the General Accountants' Association, and was a member of the board of examiners of the School of Higher Commercial Studies, Montreal.

The funeral, held on September 12th, was attended by many who are prominent in business and professional life in Montreal, including L. Belanger, past president of our Society; G. T. Bowden, past chairman of Montreal Chapter; R. W. Louthood, chairman of Montreal Chapter; R. Schurman, secretary of Montreal Chapter; L. N. Buzzell, C.A.; A. J. M. Petrie, E. C. Baker, and H. Viau.

DEATH OF W. G. DONALDSON

Following an illness since February last, William G. Donaldson, a well-esteemed member and former director of Toronto Chapter, died at his residence, 446 Briar Hill Boulevard, on September 8th.

The late Mr. Donaldson was in his fifty-ninth year, and had been Secretary-Treasurer of the A. T. Reid Company, Limited, since 1927.

NEW MEMBERS

The following are new members of the Society:

Montreal Chapter

Adams, A. E., Secretary-Treasurer, Inter City Baking Co. Ltd.,
Montreal, Que.
Bancroft, J. J. F., Jenkins Bros., Ltd., Montreal, Que.
Craniford, H., Canadian Celanese, Ltd., Drummondville, Que.
Fortescue, G. J., The Miner Rubber Co., Ltd., Granby, Que.
Joubert, R., Department of National Revenue, Montreal, Que.
McDougall, H. J., C.A., Howard J. McDougall & Co., Newfoundland.
Quinlan, L. C., 1170 Dorchester Street West, Montreal, Que.

Toronto Chapter

Beeston, G. H., c/o V. D. Harbinson, Toronto, Ont.
Glover, H., C.A., Henry Glover & Co., Toronto, Ont.
Lindsay, E. C., Secretary-Treasurer, Honey Dew, Ltd., Toronto, Ont.

Hamilton Chapter

Clarke, A. R., Wallace Barnes Co. Ltd., Hamilton, Ont.
Richmond, G. H., Jr., International Silver Co. of Canada, Ltd.,
Hamilton, Ont.

COST AND MANAGEMENT

CHAPTER NOTES

MONTREAL

R. Schurman, C.A., Secretary

The first business meeting of the officers and directors of the Montreal Chapter of the Canadian Society of Cost Accountants and Industrial Engineers was held during a luncheon meeting at the Queen's Hotel on Tuesday, September 22nd. The meeting was exceedingly well attended.

Four applications for membership were presented and approved, these being Mr. Rodolphe Joubert of the Income Tax Division of the Department of National Revenue; Mr. John J. F. Bancroft of Jenkins Bros. Ltd., valve manufacturers; Mr. Leonard C. Quinlan, recently cost accountant for a large firm of construction engineers in Jamaica; Mr. Herbert Cranford, of Canadian Celanese Ltd., Drummondville.

The Montreal Chapter have sponsored an excellent course of training on the subject of cost accounting, which is being conducted by the Montreal Board of Trade. Professor R. R. Thompson of McGill University, Mr. L. N. Buzzell, and Mr. D. R. Patton are among the lecturers on the various subjects of the course. Montreal Chapter donated prizes in an amount of \$50.00 for proficiency in a subject of the course.

The Chairman, who directs cost accounting records for the Beauharnois Power Corporation, extended an invitation to the members of the Montreal Chapter and their friends to visit the construction work being carried on at the Beauharnois Power plant on October 3rd. The members are to be guests of the Beauharnois Corporation for this visit, and will have an opportunity to see the development work on Canada's gigantic undertaking.

An excellent programme for the year was outlined by the Chairman. The opening dinner on October 23rd is to be addressed by R. O. Sweezey, B.Sc., president of Beauharnois Power Corporation Limited.

On November 6th Mr. S. P. Mapes, general manager of Recording & Statistical Corporation Limited, will present to the Chapter "The Punched Hole Method" of inventory and statistical accounting records.

Mr. O. E. Sharpe, Commissioner of the Workmen's Compensation Commission of the Province of Quebec, will on November 20th enlighten the members on the recent provincial legislation on "Workmen's Compensation Accident Fund Administration and Accounting".

December 3rd has been selected as an open forum, and the senior classes in accounting will have this night to themselves to present various problems encountered in their study group.

The Chief Engineer of the Montreal Tramways Commission, Mr. A. Duperron, will on January 21st tell the Chapter many things connected with the "Montreal Tramways Contract".

Insurance Costs, and more particularly those departments devoted to Fire and Use and Occupancy will be the subject for a paper by Mr.

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A. J. Mylrea, Vice-President of Reed, Shaw & McNaught Ltd., insurance experts, on February 4th.

On February 18th one of the Society's members, Mr. S. Farquharson of Farquharson & Associates, industrial engineers, will present a paper and lead in a discussion on the subject of "Industrial Research". Mr. Farquharson having specialized in industrial research, will undoubtedly make this subject both interesting and entertaining.

On March 4th the junior class in cost accounting are to be given the privilege of an open forum, with full scope for their ideas to be heard.

On March 18th Mr. Alderic Raymond, manager of the Windsor Hotel, will tell the Chapter many things connected with the detailed costs and intricacies of hotel accounting and management.

The closing dinner will be held on April 8th, at which it is expected that Mr. Beaudry Leman, general manager of the Banque Canadienne Nationale, will address the Chapter and their friends. Mr. Leman is regarded as one of the outstanding bankers in Canada, is an excellent speaker, and the members look forward with a great deal of pleasure to this address.

The Montreal Chapter, and in fact, the Canadian Society of Cost Accountants & Industrial Engineers, has in the recent death of our esteemed member, George C. Leroux, sustained a great loss. Mr. Leroux was a representative of Montreal Chapter on the Dominion Board. In token of the great regard and esteem in which our fellow member was held, a resolution of sympathy has been passed by the Directors, expressing the very deep regret and keen sense of loss which the Society has sustained.

Copy of a Resolution passed by the Directors of the Montreal Chapter of the Canadian Society of Cost Accountants & Industrial Engineers, on Tuesday, September 22nd, 1931:—

"RESOLVED: That this Committee wishes to express its deep regret and keen sense of loss on the death of Mr. George Leroux, C.P.A., Vice-President of the Society.

"Mr. Leroux has been a member of the Society since its formation, and has been successively member of the Montreal Chapter Committee (for several years), vice-chairman and chairman of the Montreal Chapter, member of the Dominion board of directors, honorary secretary (for several years) and vice-president of the Society. Had he lived he would have been president of the Society.

"He was one of the strongest supporters which the Society had, being regularly present at the meetings, giving papers, and taking part in the discussions to the profit of all who heard him, and in every way at functions of the Society doing all in his power for its welfare and that of its members. Not only was he gifted with high intellectual abilities, but he had a charm, a kindness and geniality of manner, which could only spring from the best of hearts, and endeared him to all who knew him. He was modest to a degree, a learner and a teacher, and gained at once the respect of all who came in contact with him. He was a man of the highest ideals and lived up to them. He was a gentleman in the highest sense of the term, in every way, and at all times. It is difficult for us to express fully our appreciation of him, and our sense of what we have lost, but we realize that there are few men of the very high calibre and standing of George Leroux."

COST AND MANAGEMENT

HAMILTON

Reported by R. Dawson, Secretary-Treasurer.

The Programme Committee of the Hamilton Chapter are busily engaged in lining up what should prove to be the best programme in the history of the Chapter, for the rapidly approaching season.

The President of the Society, Mr. H. E. Guilfoyle, will commence the proceedings on October 15th with a talk on "The Interpretation Of Business Statements," while the closing meeting, scheduled for April 7th, should prove a real wind-up with a really fine orator in the person of Mr. Martin L. Pierce, of the Hoover Company, North Canton, Ohio, speaking on "Sales Statistics, The First Step In Budget Control."

Subjects which will be heard throughout the season are: "Cost Studies On Changes In Operations", "The Thirteen Month Calendar", "The Planning And Building Of A Modern Factory", "The Use Of Graphs And Charts In Business", "The McMillan Report", "Costs That Enter Into A Telephone Bill", "Wage Incentives And Time Studies" and "Members' Problems". Surely a most diversified programme and one which should appeal to every member.

An innovation which should prove decidedly popular will be tried on two meeting nights during the months of January and February, when in the former month a Chapter Smoker will be held, which promises to become a most enjoyable annual affair. In February a Theatre Night is planned, and by these methods it is hoped to sustain the interest of the members at a time when this interest is most likely to fade somewhat.

In the very near future the executive will take up the pressing question of increasing the membership, and altogether the Ambitious City Chapter can look forward to a season of great activity.

CENTRAL ONTARIO

C. R. Dorschell, Secretary-Treasurer.

The first meeting of Central Ontario Chapter for the 1930-31 season will be held in Guelph on Monday, October 19th. The speaker will be H. E. Guilfoyle, F.C.A., president of the Society. Members will be notified of the details of the meeting.

WINNIPEG

T. E. Saul, C.A., Secretary.

A meeting of Winnipeg Chapter was held on Tuesday, September 29th, at the Carleton Club, 6.30 p.m. There were 28 members and their friends in attendance. E. J. Burleigh occupied the chair.

W. Sanford Evans, prominent statistician of Winnipeg, spoke on general business conditions, illustrating price trends by means of numerous graphs, which showed how prices of grains and other raw materials had fallen out of line with commodities as a whole. Before

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prosperity could return to the west, he said, it was necessary either for raw materials to regain part of their loss, or for other goods to come down in proportion. At the same time he showed, by reference to prices for sugar, rubber, copper, etc., that the grain growing countries are not the only ones which are badly hit.

W. A. McKague, general secretary of the Society, spoke on "Practical Uses of Costs" and on the work of the Society as a whole. He emphasized the point that while business heads often hesitated about installing cost systems, through fear of the additional work and expense, and doubt as to the value of the figures, they found the results of value once a cost system was working, and in spite of the radical changes in policy being made under present conditions, he did not know of any firm which, having once experienced the value of costs, was prepared to do without these figures.

J. B. Sutherland, W. J. Mundell and several others took part in the discussion.

VANCOUVER

R. V. Kirkby, Secretary-Treasurer.

The opening meeting of Vancouver Chapter was held on Tuesday, September 15th, at 8 p.m., at the usual place in the Vancouver Hotel. The attendance numbered 24. Harold D. Campbell, chairman, welcomed the members back for a new season's activities. Program arrangements are well advanced, and the Chapter looks forward to a successful year.

J. J. Plommer, C.A., outlined his work as lecturer in Cost Accounting at the University of British Columbia, emphasizing "the student mind" from the viewpoint of an instructor.

W. A. McKague, general secretary of the Society, was present at the meeting, and spoke briefly on "Practical Uses of Costs" and also about the work of the Society as a whole.

Chairman Campbell also referred to the recent visit to Vancouver of K. A. Mapp, F.C.A., chairman of Toronto Chapter of the Society, during which he met several of the Vancouver directors at luncheon.

Mr. McKague also met the Chapter directors at a luncheon in the Hudson's Bay Company's rooms, when the affairs of the Society were discussed.

A well-known professor states that the earth's crust is continually moving. Others have made this statement, and the next morning been fined \$2 or eight days.

Mrs. Youngwife (at breakfast): There's no bread on the table, Nora.

Nora: Sure, there's none in the house, mum.

Mrs. Youngwife (severely): Then make some toast.

Question: "How can five persons divide five eggs so that each man will receive one and still one remain in the dish?"

Answer: "One takes the dish with the egg."

COST LITERATURE

RECEIVED IN SEPTEMBER

NEED of Adjustable Budgets for Control of Business Operations. F. J. Heinritz. National Association of Cost Accountants Bulletin, September, 1931.

Distribution Cost Accounting. C. F. Eveleigh and J. O. Waymire. National Association of Cost Accountants Bulletin, September, 1931.

General Principles of Factory Costing. P. H. Walker. The Accountant, August 22, 1931.

Training Employees to Eliminate Waste. R. G. Adair. National Association of Cost Accountants Bulletin, September 15, 1931.

Inventory Control as Used by Taylor Instrument Companies of Rochester, N.Y. J. F. Clark and H. J. Noble. National Association of Cost Accountants Bulletin, September 15, 1931.

Power Cost Accounts. J. Whitmore. Journal of Accountancy, October, 1931.

THE TREND OF PRODUCTION COSTS

THIS Dominion Bureau of Statistics index number of commodity prices, with 1926 as the base period, declined from 71.7 in July to 70.9 in August. The main groups compare as follows:

	Aug. 1930	July 1931	Aug. 1931
Foods, beverages and tobacco.....	87.2	69.9	69.4
Other consumers' goods.....	85.7	80.0	79.9
All consumers' goods.....	86.3	76.0	75.7
Producers' equipment.....	91.2	89.1	89.1
Building and construction materials.....	87.8	83.3	82.1
Manufacturers' materials.....	76.6	61.0	59.7
All producers' materials.....	78.6	65.0	63.8
All producers' goods.....	79.9	67.4	66.3
All commodities.....	83.7	71.7	70.9

The most important reductions in August were in the following: Fresh, foreign and canned fruits, flour and milled products, meats, poultry, raw cotton, raw wool, drugs and pharmaceutical chemicals. The most important advances were in the following: Dried fruits, eggs, raw silk, carpets, tin ingots, dyeing and tanning materials.

An Englishman on a visit to the West decided to go horseback riding. The hostler who was to attend him asked: "Do you prefer an English saddle or a western?"

"What's the difference?" he asked.

"The western saddle has a horn," replied the attendant.

"I don't think I'll need the horn," said the Englishman, "I don't intend to ride in heavy traffic."

